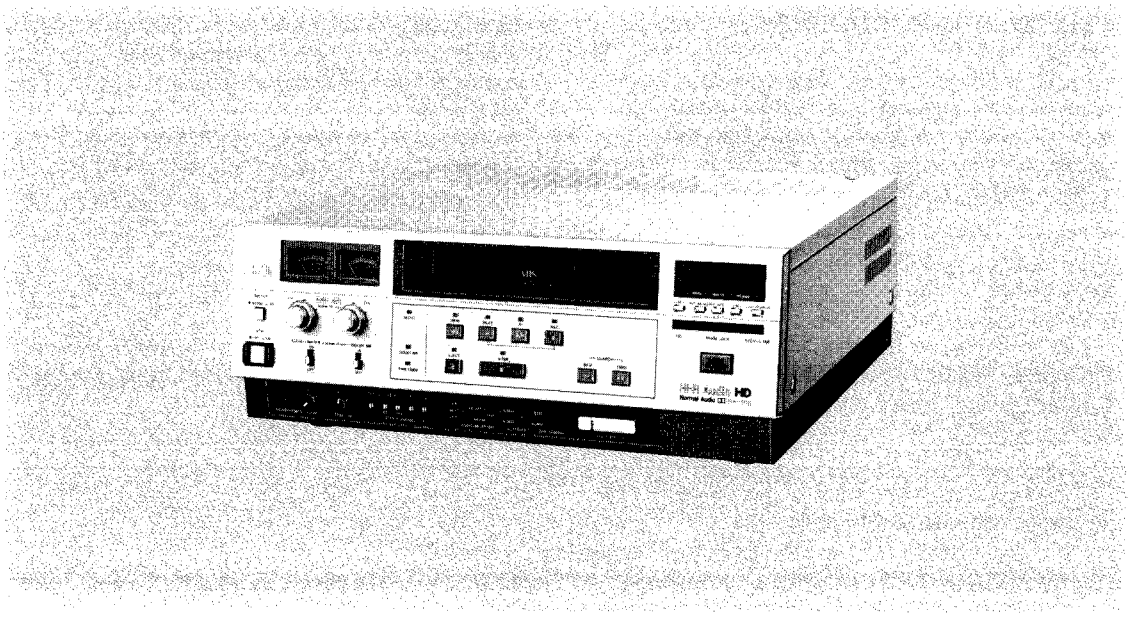
Operating Instructions

VHS PAL Hi-Fi

Video Cassette Recorder

AG-6810



Panasonic/National

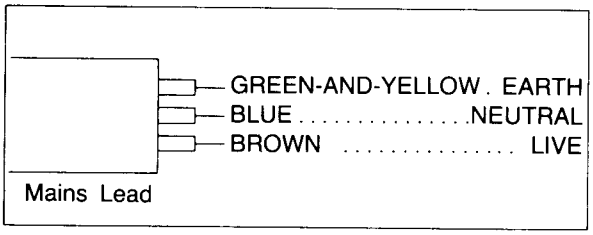
Before attempting to connect, operate or adjust this product, please read these instructions completely.

VQT1720

For Your Safety

DO NOT REMOVE PANEL COVER.
To prevent electric shock, do not remove cover.
No user serviceable parts inside. Refer servicing to qualified service personnel.

1. **THIS APPARATUS MUST BE EARTHED.**
   To ensure safe operation the three-pin plug supplied (not U.K. model) must be inserted only into a standard three-pin power point which is effectively earthed through the normal household wiring.
   Extension cords used with the equipment must be three-core and be correctly wired to provide connection to earth. Wrongly wired extension cords are a major cause of fatalities.
   The fact that the equipment operates satisfactorily does not imply that the power point is earthed and that the installation is completely safe. For your safety, if in any doubt about the effective earthing of the power point, consult a qualified electrician.
2. **DO NOT REMOVE PANEL COVER BY UNSCREWING.**
   To prevent electric shock, do not remove cover. No user serviceable parts inside. And do not insert fingers or any other objects into the video cassette holder.
3. **VOLTAGE SELECTOR SETTING.**
   The power cord of this unit must be disconnected from mains before the voltage selector is changed.
   Before connecting to the power supply, ensure that the selector on the rear panel is selected to the same voltage as your local power supply.
   The voltage selector can be adjusted, if necessary, by using a screwdriver, but this adjustment must be made after disconnecting the power cord.
4. **AC POWER CORD CONNECTION.**
   (AG-6810 U.K. only)
   The wires in mains lead for this apparatus are coloured in accordance with the following code.



As the colours of the wires in the mains lead of this apparatus may not correspond with the coloured markings identifying the terminals in your plug proceed as follows:
The wire which is coloured GREEN-AND-YELLOW must be connected to the terminal in the plug which is marked by the letter E or by the safety earth symbol ⏚ or coloured GREEN or GREEN-AND-YELLOW.
The wire which is coloured BLUE must be connected to the terminal which is marked with the letter N or coloured black.
The wire which is coloured BROWN must be connected to the terminal which is marked with the letter L or coloured red.

Remark:
This apparatus was produced to BS 800:1977.
Dieses Modell entspricht der EG-Vorschrift (für Funkstörungsschutz) 82/499/EG.
La Société PANASONIC-FRANCE, importateur du matériel MATSUSHITA-JAPON déclare que cet appareil est conforme aux prescriptions de la directive 76/889/C.E.E. (arrêté du 14 janvier 1980).
Dit model is onderworpen aan de EEG-richtlijn (ter voorkoming van radio-interferentie) 82/499/EEG.
Denne model opfylder EF direktiv 82/499/EF (for forebyggelse af radiointerferens).

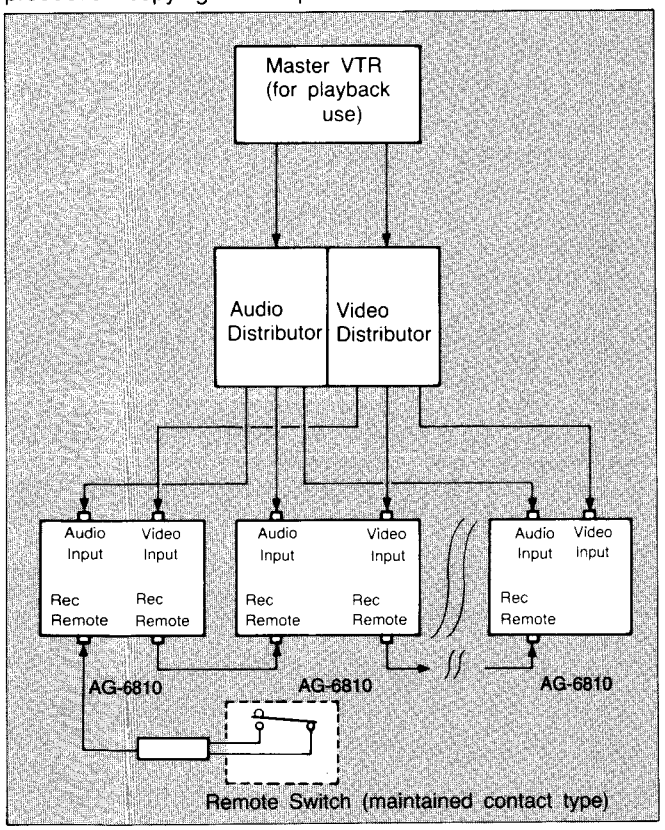
WARNING: TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE.

AG-6810 VTR Systems

IMPORTANT
"Unauthorized recording of copyrighted television programmes, films, video tapes and other materials may infringe the right of copyright owners and be contrary to copyright laws."

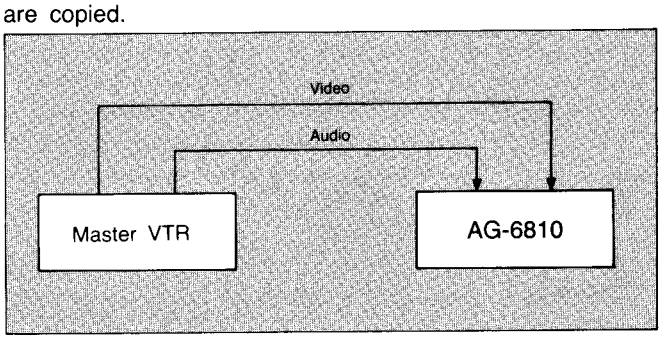
Dubbing System I

Two or more of these units can be connected for mass production copying of a tape.

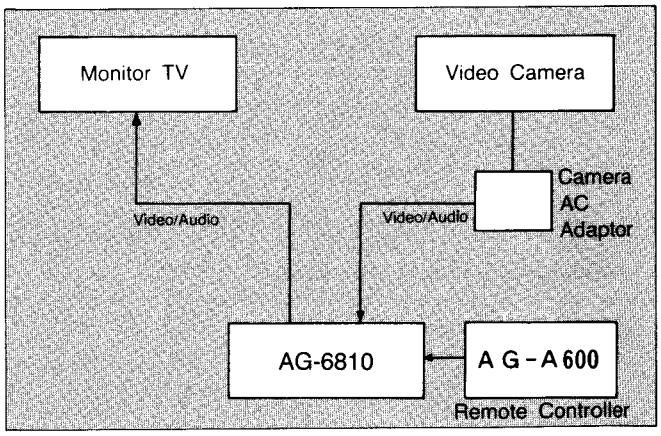


Dubbing System II

This is a basic dubbing system; the contents of a master tape are copied.



Recording and Playback



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Features

1. FM audio recording (HD sound)

The FM recording system records an audio signal that has been converted to a wide-band FM signal on tape.
HD sound recordings use 2 rotating heads exclusively for audio recording. This makes it possible to obtain sound recordings that are superior in frequency characteristics, wow and flutter, and dynamic range to normal audio recordings made with fixed heads. (HD sound is an abbreviation of High Dynamic Sound.)

2. Series recording (special for dubbing use)

By providing an on/off type remote control box, it is possible to do series recording from a Master VTR onto a maximum of 500 AG-6810 units (connected in series) at one time. In this series recording, with the remote control box from ON to OFF, the following operations can be performed by means of adjustments inside the main unit.
(If you wish to have these adjustments made please consult your dealer.)

A. The VTR can be stopped automatically during recording.
B. The VTR can be paused automatically during recording.
C. During recording the tape can be rewound to the beginning, the VTR stopped and the tape automatically removed.
D. During recording the VTR can be stopped and the tape automatically removed (the unit is shipped from the factory in this mode).

3. Audio input and output jacks for normal audio and HD sound

There are independent input and output jacks for normal sound and HD sound on the rear panel.
An audio input signal that is connected to the normal audio input jack is automatically connected through to the HD sound input jack.

Other characteristics

- An audio limiter circuit is built in (only for normal audio). During normal audio recording, the limiter circuit acts on excessively loud input.
- A Dolby NR* System is built in for normal audio.
- Meters are included for use in adjusting the audio recording volume.
- Automatic Rewind at Tape End "ON/OFF" selectability (internal switch)
- Mode lock switching with indicator lamp: when one button is being operated, other buttons become inoperative.
- There is a connecting jack for time code signal use.
- Elapsed time can be indicated on a counter during recording.
- There is an indicator showing how much tape is left.
- There is a headphone volume adjustment.
- It is possible to see the tape directly by the mirror in the front loading mechanism.
- The unit is front loading.
- There is an hour meter.
- There is a fan motor.
- The VTR can be stored on an EIA standard 19-inch rack.
- HD and normal sounds recording without video signals.
- HD sound recording "ON/OFF" selectability.
- Remote control is possilble for ON/OFF switching of HD sound audio recording.
- Remote control is possible for ON/OFF switching of HD sound audio monitoring.

*When the HD sound is switched to OFF, the normal audio will be obtained.

- Test terminals
  The head output of video and HD sound can be confirmed with an oscilloscope at the test terminals provided on the front panel.
- "Eject/Auto OFF" lamp
  When no cassette tape has been inserted or when there is dew inside this unit, this lamp lights, and it flashes in case of trouble with the tape run system.
- Search function
- ON/OFF switching is possible for short FF. (By using an internal switch)
  When the transparent part at the start of the tape is detected, automatic winding is executed by the short FF function, and ON/OFF switching of this function is possible by using an internal switch.
- ON/OFF switching (by using an internal switch) is possible for the automatic cassette tape ejection function at the time of tape end detection during recording.
- ON/OFF recording with record prevention tab removed.
- Correspondence to serial code remote control is possible. For details, consult your local dealer.

*'Dolby' and the double-D symbol are trademarks of Dolby Laboratories Licensing Corporation.

Inspection

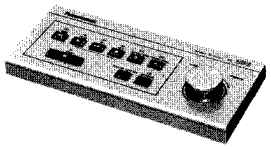
CAUTION:
TO PREVENT FIRE OR SHOCK HAZARD AND ANNOYING INTERFERENCE, USE THE RECOMMENDED ACCESSORIES ONLY.

Standard Accessories

After removing the unit from its box, check to be sure it has not sustained any damage. Also check to see that you have the following accessory as pictured below.

Cap for protecting sound volume	Part No.	
	VFK0358	2 pcs.

Optional Accessories

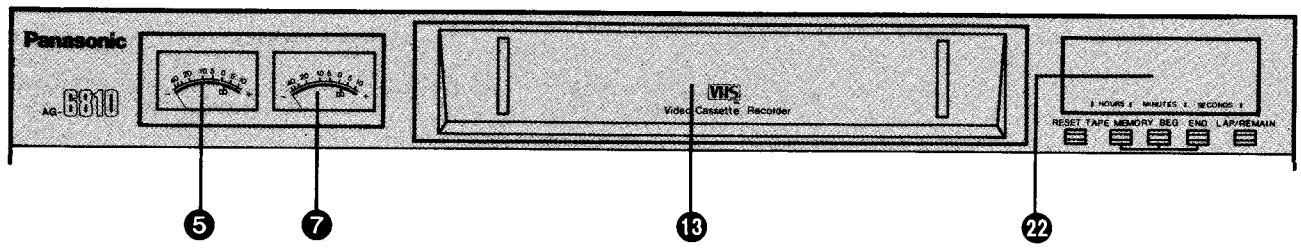


Remote Controller
AG-A600

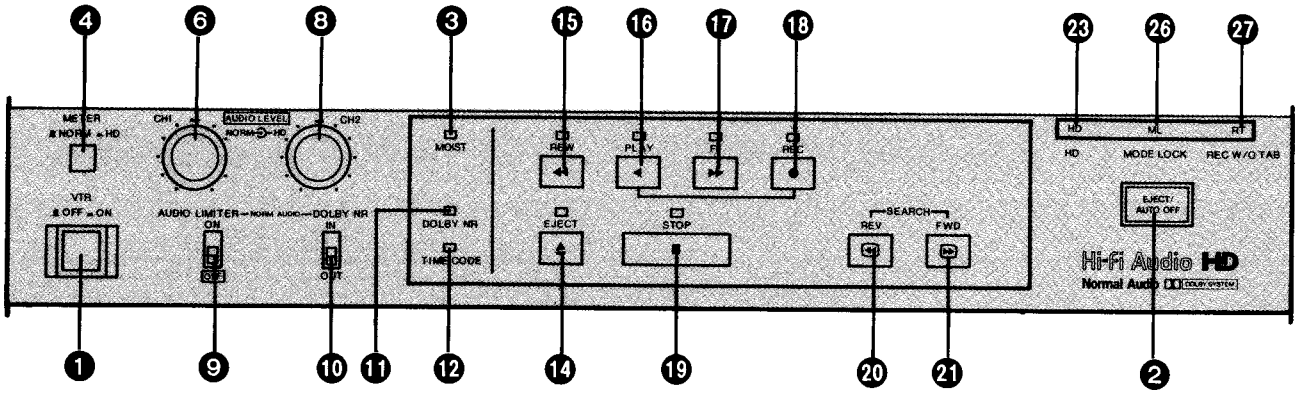
Regarding Rack Mounting:
Use optional Rack-mounting Frame AG-M600.
When mounting the VTR in a rack, be sure to install a fan for heat dissipation on the rack before using.
For details, please consult your authorized dealer.

Controls and Indicators

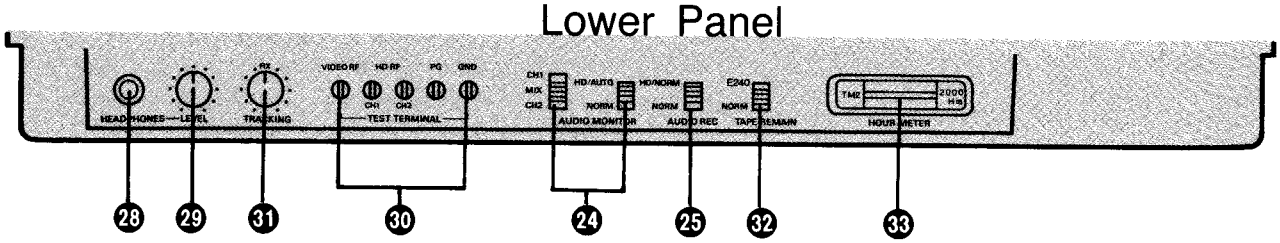
Upper Panel



Middle Panel



Lower Panel



Power Section (Middle Panel)

❶ VTR Switch [VTR]
Power is supplied to the unit when this switch is activated. The audio CH1 and CH2 meter lamps light. The Eject/Auto OFF lamp lights when no tape is inserted. The tape counter illuminates, and the tape is set to intermediate loading position. When the switch is pushed again, the power is switched off.

> •Aven om denna omkopplare är i "OFF"-läge, har fortfarande en del av apparaten nätspänning.
> •Selv om denne omskifter er i "OFF" stilling, tilføres en del af apparatet stadig strøm.

❷ Eject/Auto OFF Lamp [AUTO OFF]
This lamp lights when no tape is inserted. It flashes when something is wrong with the tape transport (such as tape slack). The unit does not operate when this lamp is flashing.

❸ MOIST Lamp [MOIST]
This lamp lights when condensation has formed inside the unit, which cause the unit to cease operating. The cassette tape will be ejected automatically (Eject/Auto Off lamp also lights).

Audio Section (Middle/Lower Panels)

❹ Meter Selector [METER]
This is the audio level meter selection switch.
HD (▂): Use when adjusting the HD sound recording input level.
NORM (▌): Use when adjusting the normal audio recording input level.

❺ Audio Channel 1 Level Meter
This is the audio channel 1 peak level indicator (decibel meter). Adjust channel 1 level control ❻ so that the meter needle does not cross the red zone (over 8).

❻ Audio Channel 1 Level Control
The inside knob is the level control knob for normal audio and the outside is for HD sound. When using normal input the control is normally set at the click stop. To adjust the normal audio level, set the Audio Limiter ❾ to "OFF" and then adjust this control so that Level Meter ❺ does not cross the read zone (over 8).

❼ Audio Channel 2 Level Meter
The operation of this is the same as described for channel 1 in ❺.

❽ Audio Channel 2 Level Control
The operation of this is the same as that for channel 1 described in ❻.

❾ Audio Limiter Selector [AUDIO LIMITER]
This selector only works during normal audio recording.
ON: When loud instantaneous noises are entering the audio input, set the audio limiter selector switch to this position. The audio limiter circuit will then operate to maintain distortion-free recording.
OFF: The sound is recorded just as it enters. Since the limiter does not operate to limit unusually loud noises, it is necessary to set the audio level low.

❿ Dolby NR Switch [DOLBY NR]
This only works during normal audio recording. When the Dolby NR Switch is set to the "IN" position, the Dolby NR System is activated.

⓫ Dolby NR Lamp
When the Dolby NR Switch is in the "IN" position, this lamp is illuminated and the Dolby Noise-Reduction System is enabled.

⓬ Time Code Lamp [TIME CODE]
When the Audio CH2 Selector Switch ⓮ on the rear panel is set to TIME CODE, this lamp lights.

Operating Buttons Section (Upper/Middle Panels)

⓭ Cassette Holder

⓮ Eject Button/Lamp [EJECT]
To remove a cassette, press this button.
If this button is pressed while the tape is moving, (during playback, fast forward or rewind) the unit will stop and then eject the cassette tape.

⓯ Rewind Button/Lamp [REW]
When this button is pressed, the cassette tape is rewound to the supply reel.

⓰ Play Button/Lamp [PLAY]
Pressing this button causes the tape to start playback. If Record Button is held down first, and then this button is pressed, the unit will go into the recording mode.

⓱ Fast Forward Button/Lamp [FF]
When this button is pressed, the tape is wound rapidly onto the takeup reel.

⓲ Record Button/Lamp [REC]
This button should be pressed and held in while Play Button is pressed to start recording both video and audio.

⓳ Stop Button/Lamp [STOP]
Used to stop the tape movement.

⓴ Search Reverse Button
When this button is held down during playback, the tape will be played back rapidly in the reverse direction.

㉑ Search Forward Button
When this button is held down during playback, the tape will be played back rapidly in the forward direction.

Tape Counter Section (Upper Panel)

㉒ Tape Counter
▭: indicates that the cassette is in the cassette holder.
▬ : indicates the minus counter position "-*:**:**" when the tape is rewound beyond the reset (0:00:00) position.
→000: indicates the counter (0:00:00) search mode by pressing the Rewind or Fast Forward Button.
↻ : indicates the one-time repeated playback mode.
⇄ : indicates the random repeated playback mode.

BEG : indicates the start position of the programme which is to be repeated.

END : indicates the end position of the programme is to be repeated.

LAP: indicates the tape position from the reset point.

REMAIN: indicates remaining tape time.

RESET Button: For setting the tape counter to "0:00:00".

TAPE MEMORY Button: For selection of either automatic tape stop when the counter reaches "0:00:00" in the rewind, fast forward, or the repeated playback modes.

> Tape Memory can be activated in this sequence:
> 1st push: →000
> 2nd push: •⮌
> 3rd push: ⮌
> 4th push: memory off

BEG Button: For selection of the start position of the programme which is to be repeated.

END Button: For selection of the end position of the programme which is to be repeated.

LAP/REMAIN Button: For selection of either the elapsed time (normal tape position from reset point) or the remaining tape time indication on the counter.

Lamp/Audio Section (Middle/Lower Panels)

㉓ HD Lamp [HD]

This lights up when HD sound is being monitored or recorded.

- When performing recording with the Audio Recording Selector ㉕ set to "HD/NORM", the HD lamp will light (when the Audio Recording Selector is set to "NORM", HD sound will not be recorded, and thus the HD lamp will remain out).
- HD lamp will light during playback only for tapes which have been recorded with HD sound (Audio Monitor Selector ㉔, must be set to HD/AUTO).
- During stop, fast forward, rewind, and search if the Audio Recording Selector is set to "HD/NORM", the HD lamp will light.

㉔ Audio Monitor Selector [AUDIO MONITOR]

Selects the audio signal which appears at the Audio Monitor Output Jacks ⑫ on the rear panel and the Headphone Jack ㉘ on the front panel.

HD/AUTO: HD Sound or automatically switched Normal Sound appears at monitor jacks.

NORM: Only Normal Sound appears at monitor jacks.

- The Audio Monitor Channel Selector controls normal audio monitoring at the Headphone Jack as follows:

CH1: Only channel 1 audio at Headphone Jack.

MIX: Separate channel 1 and channel 2 at Headphone Jack.

CH2: Only channel 2 audio at Headphone Jack.

(See page 18 "SOUND MONITORING")

㉕ Audio Recording Selector [AUDIO REC]

HD/NORM: To record HD sound and normal audio.

NORM: To record only normal audio.

㉖ Mode Lock Lamp [ML]

When the Mode Lock Selector switch ⑰ on the rear panel is set to "ON", the ML (Mode Lock) lamp lights up.

㉗ Record Tab Lamp [RT]

(recording mode without record prevention tab on the tape)

When this lamp is lit, recording is possible even if the Record Prevention Tab is missing.

Headphone Section (Lower Panel)

㉘ Headphone Jack [HEADPHONES]

Permits listening with headphone to a channel or channels selected by the Audio Monitor Selector ㉔.

㉙ Headphone Level Control [HEADPHONES-LEVEL]

This volume controls the headphone level.

Test Terminal Section (Lower Panel)

㉚ Test Terminals [TEST]

An oscilloscope can be connected to these terminals for confirmation of video and HD sound head output during playback.

Video RF: Connect to the oscilloscope input terminal to check the video head output.

HD RF (CH1/CH2): Connect to the oscilloscope input terminal to check the HD sound head output.

PG: Connect to the external trigger terminal of the oscilloscope.

GND: This is the grounding terminal.

Note:

These Video and HD Outputs are provided for customers convenience only. Please do not use above terminals for measurement purposes.

Tracking Section (Lower Panel)

㉛ Tracking Control [TRACKING]

Normally leave this control in its centre "FIX" detent position. Occasionally tapes made on other video cassette recorders may exhibit noise or streaks during the normal playback and require adjustment of this control.

Tape Selector (Lower Panel)

㉜ Tape Remaining Selector [TAPE REMAIN]

Matches time countdown circuits to the type of tape used.

E240: For use with the NV-E240 tape.

NORM: For use with the NV-E180, E120, E90, E60 or E30 tape.

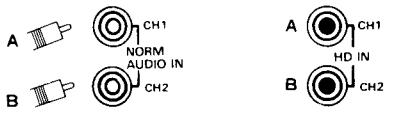
㉝ Hour Meter [HOUR METER]

Indicates the head rotation time (max. 5000 hours).

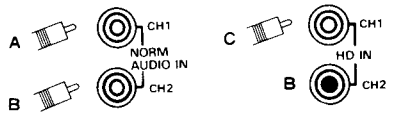
Connections

Depending on how the connections are made to the normal audio input terminals and the HD sound input terminals, the audio operation will change as shown below, so please keep this in mind in making these connections.

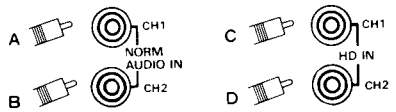
- Audio input A automatically inputs to the jacks with the solid circles in the middle.



- A and B automatically input to the jacks with solid circles in the middle, as shown in the diagram.

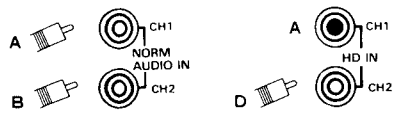


- Audio input B automatically inputs to the jack with a solid circle in the middle.



- Audio inputs A, B, C and D are direct inputs to the jacks as shown in the diagram.

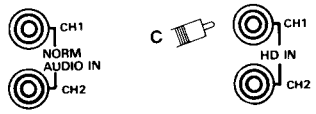
- Audio input B automatically inputs to the jacks with solid circles in the middle.

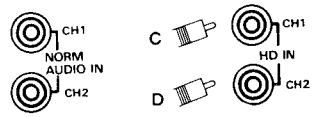


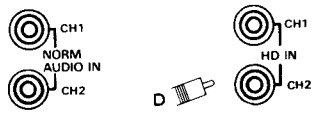
- Audio input A automatically inputs to the jack with a solid circle in the middle.

Caution

As shown in the diagrams below, audio inputs connected to the HD input jacks are input only to those jacks to which they are directly connected. There is no auto input to the normal audio input jacks!



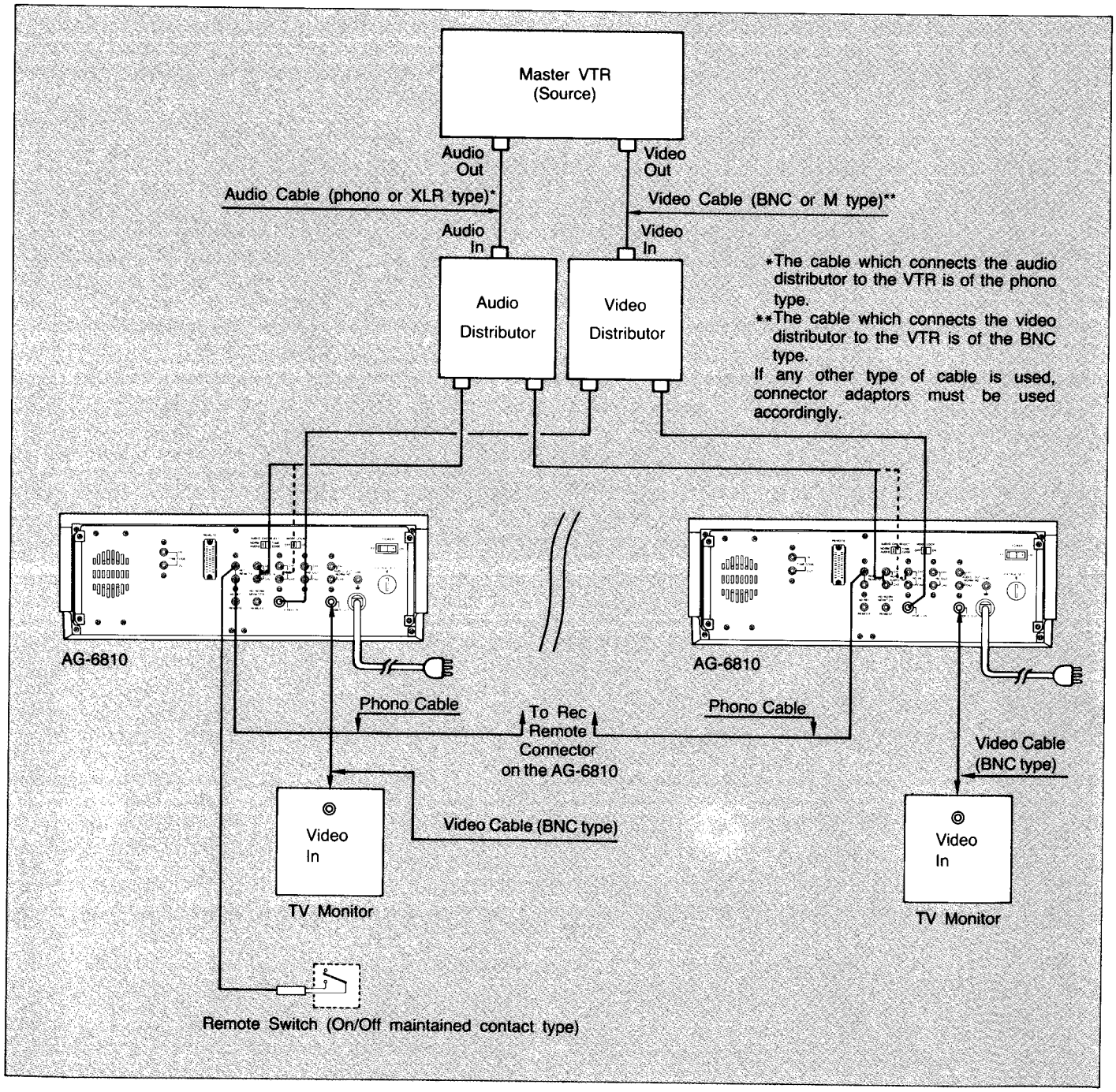




Note:

Even though audio inputs to the normal audio input terminals are automatically connected to the HD input terminals as shown, HD recording will only be made when the Audio Recording Selector ㉕ is set to HD/NORM position.

Dubbing System I


Master VTR
(Source)
Audio Out
Video Out
Audio Cable (phono or XLR type)*
Video Cable (BNC or M type)**
Audio In
Video In
Audio Distributor
Video Distributor
*The cable which connects the audio distributor to the VTR is of the phono type.
**The cable which connects the video distributor to the VTR is of the BNC type.
If any other type of cable is used, connector adaptors must be used accordingly.
AG-6810
AG-6810
Phono Cable
To Rec Remote Connector on the AG-6810
Phono Cable
Video Cable (BNC type)
Video In
TV Monitor
Video Cable (BNC type)
Video In
TV Monitor
Remote Switch (On/Off maintained contact type)

The audio and video output jacks of the master VTR are connected to the input jacks of the audio distributor and the video distributor, respectively. The output jacks of the audio distributor and video distributor are then connected to the audio and video input terminals of the AG-6810 using an audio cable (phono type) and video cable (BNC type), respectively.

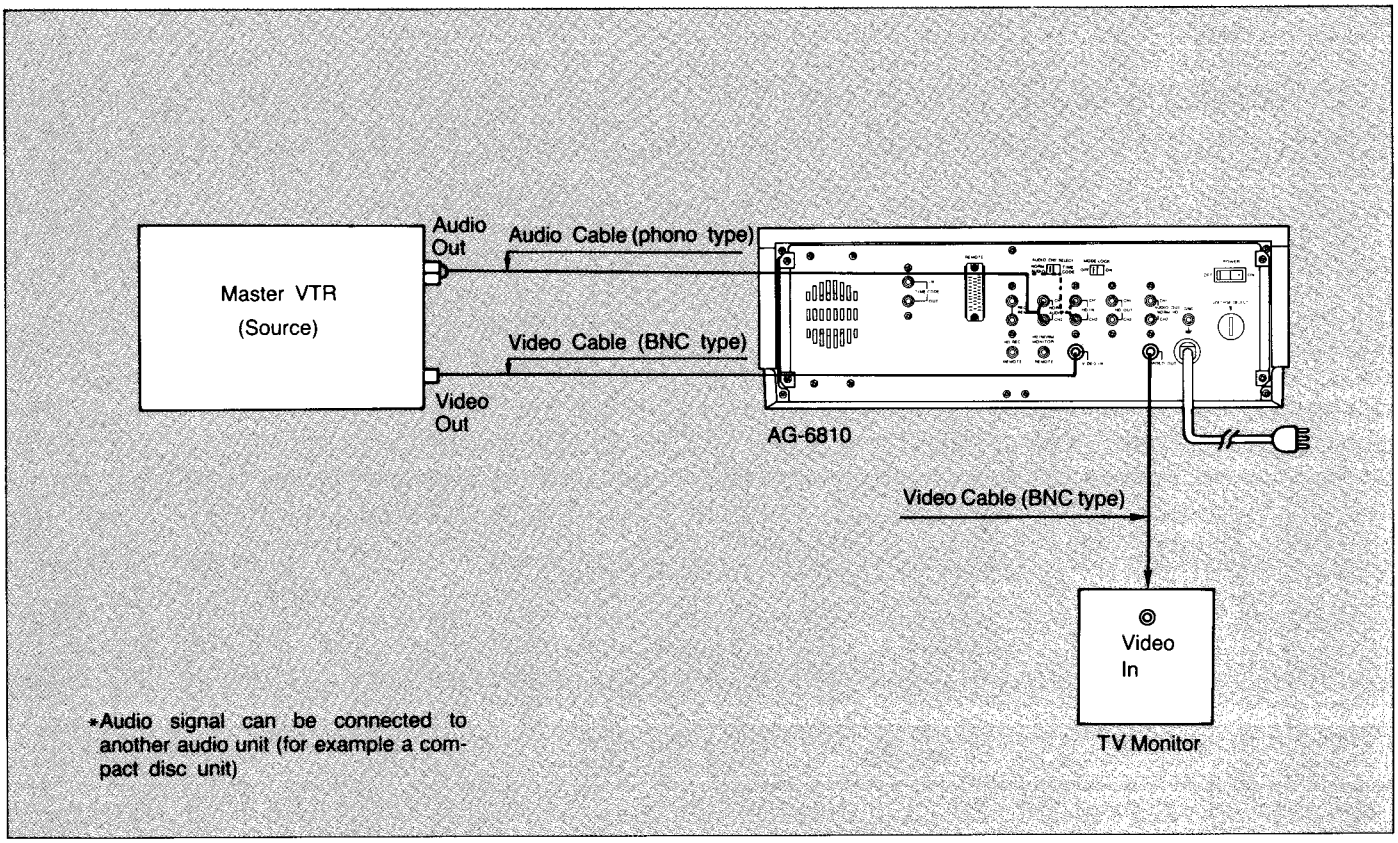
- The alternate dotted line connection of the audio input to the HD IN terminals on the AG-6810 is used if you wish to record only in HD Sound (see page 11).

The remote switch box is connected to the recording remote control jack of the first VTR. Phono type cable is used to connect the recording remote control jacks of the first and second VTRs together. Remaining VTRs in the series are connected in a similar manner.

When the video signal is to be monitored, video cable (BNC type) is used to connect the VTR to the TV monitor.

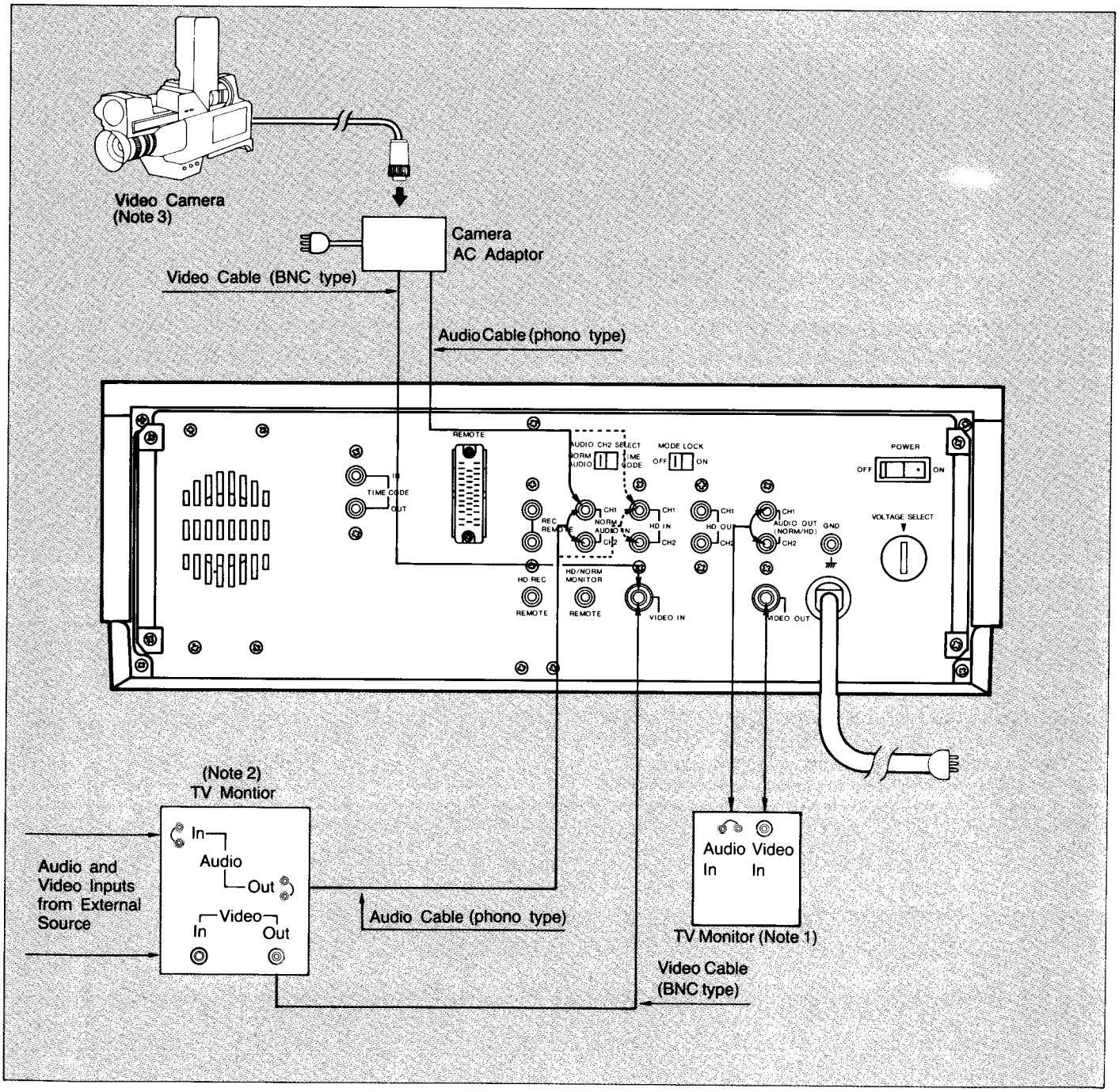
- The two remote control terminals on each VTR are internally connected together so that either terminal can be used to connect between VTR's.

Dubbing System II



An audio cable (phono type) is used to connect the master VTR to the AG-6810. Similarly, the video connectors of the two units are connected by a video cable (BNC type).
When the video signal is to be monitored, video cable (BNC type) is used to connect the VTR to the TV monitor.

Recording and Playback



Notes:

1. When the connection is to be made to a TV Monitor that does not have an 8-pin terminal (a monitor television which has only normal audio and video connection terminals), separate audio and video cables (phono type and BNC type, respectively) are used to make the connection. When the monitor television has both L (left) and R (right) audio jacks, channel 1 is connected to L and channel 2 to R.
2. If a combination TV Receiver/Monitor is used, the TV Receiver can be used as a recording source.
   If only a TV Monitor is used, then another external source is required to be connected at the Audio and Video Input Terminals as shown.
3. When the VTR is to be connected to a video camera, an audio cable (phono type) and video cable (BNC type) are used to connect the VTR to the Camera AC Adaptor. Then the AC adaptor must be connected to the video camera.

Dubbing Operation

Operation of Dubbing System

1. Perform the following operations before connecting the remote switch.
   1-1 Turn the power ON to all of the units to be connected.
   1-2 Load a pre-recorded cassette tape in the master VTR.
   1-3 Play the master VTR and adjust the sound recording level of each AG-6810 (refer to the discussion of "sound recording level adjustment" in the section on recording operations).
2. Load a blank tape in each AG-6810.
3. Perform the following short test recording to see that each AG-6810 records correctly.
   3-1. Connect the remote switch. Turn switch on and check that each AG-6810 goes into record mode.
   3-2. Record a short test section of tape and then turn off the remote switch.
   - To check the test recording of any AG-6810, rewind the tape and play back on the optional TV Monitor.
4. Rewind (or fast forward) the tape in the master VTR to the position where dubbing is to be performed.
5. Turn the remote switch ON. This starts the dubbing. The AG-6810 counters are automatically reset.

- Headphone can be used to monitor the audio.

Notes:

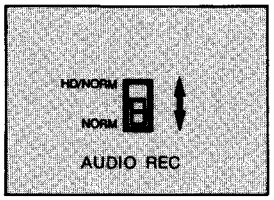
- In order to record in HD Sound, the Audio Recording Selector on the lower front panel must be set to the HD/NORM position.

- When the Remote Switch is switched from ON to OFF during recording, the following operations can be performed by means of adjustments inside the AG-6810.
  1. The VTR can be stopped automatically during recording.
  2. The VTR can be paused automatically during recording.
  3. During recording, the VTR can be automatically stopped and the cassette automatically ejected at that point (the unit is normally in this mode at the time of factory shipment).
  4. During recording, the tape can be automatically rewound and the VTR stopped at the beginning of the tape, and the cassette automatically ejected.

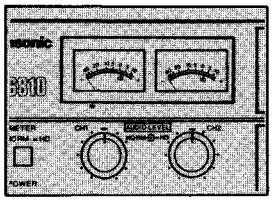
For details on these adjustments please consult with your dealer.

Recording Operation

1. Turn the power ON to all of the units that are connected.

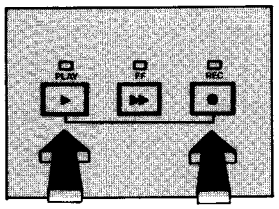


2. Set the Audio Recording Selector to "HD/NORM" or "NORM" in accordance with the kind of sound to be recorded.
   - In the HD/NORM position, both HD and Normal Audio will be recorded if audio is connected to the Normal Audio Jacks.



3. Adjust the sound recording level using the procedure given in "Sound Level Adjustment" on the right.

4. Load a cassette tape into the VTR (AG-6810).



5. Press the Record and Play Buttons simultaneously.
   Recording starts.
   Tape Counter is reset to "0000" automatically.

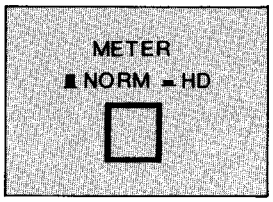
- When the sound is to be monitored, use headphone or a TV monitor.
- When the Audio Recording Selector is set to NORM position, the Audio Monitor Selector must be set to NORM position to monitor the sound being recorded.

Sound Level Adjustment

- **When performing ordinary audio recording, go through the following adjustments.**

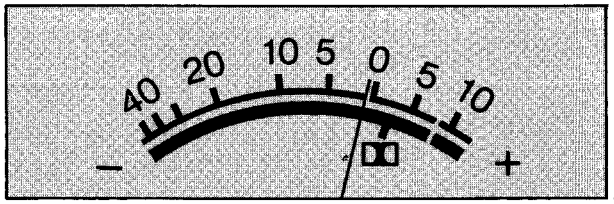
❶ Turn the power ON to all of the units that are connected.

❷ Set the Meter Selector according to whether HD sound recording, or normal audio recording is to be performed.



❸ Connect headphone and monitor the sound recording level.

❹ Look at the level meter; then, while monitoring the sound with the headphone, turn the level control right and left until the optimum level is reached.
Adjust so that the needle of the level meter will not cross the red zone at the highest peak. If the red zone level is exceeded during recording, there is a possibility that the sound will be distorted during playback.



- For adjustment of the sound recording level during normal audio recording, perform the adjustment with the Audio Limiter Selector set to off. After the adjustment, reset the switch to on. The limiter circuit operates to prevent excessively strong input from being recorded, and should normally be ON. The limiter circuit operates on channel 1 and channel 2 simultaneously.
- There are separate sound level controls for HD sound and normal audio recording. Be careful to use the right ones when adjusting the sound level.
  If howling occurs when the volume is raised, turn the volume on the TV Monitor down.
- When recording HD sound only, turn down the normal sound level controls to their minimum position.

- **When a recording remote control jack is used to dub the contents of the tape in the master VTR on a number of other tapes at one time, perform the following adjustment.**

❶ Turn the power ON to all of the units that are connected.

❷ Set the VTR sound level control on each recording AG-6810 to the centre "click" position.

❸ Supply a monotone reference signal from VTR master to all the AG-6810's. Adjust the master VTR audio output level so that the needle of the level meter of the AG-6810 indicates 0. (0 corresponds to monotone input of −8 dB).

❹ Supply normal sound and check so that the needle of the level meter will not cross the red zone at the highest peak.

Note:
Be sure that the level meter is the **peak level meter.**

•When using to duplicator Dolby NR encoded video tapes proceed as follows:

This product contains a high accuracy Dolby NR circuit which has been approved by Dolby Laboratories Licensing Corporation for commercial video tape production.

❶ Make sure that the signal feeding the AG-6810 slaves does not pass through an external Dolby NR encoder.

❷ Switch Dolby NR on AG-6810 slaves **ON**.

❸ Feed from master playback machine a 1 kHz tone at a level corresponding to the approximate **peak** level from the master tape.

❹ Switch limiter on slaves **OFF**.

❺ Adjust normal audio level for Dolby level.
Adjust HD audio level for "0" level.

❻ Switch limiter back ON on all slaves.

Protection Device

1. MOIST Function

When condensation has formed inside the unit, the MOIST lamp will light if the power is ON. While the MOIST lamp is lit, the unit will not function. Let the unit remain at a room temperature, with power ON until the MOIST lamp is no longer lit.

2. MODE LOCK FUNCTION

When this switch on the rear panel is set "ON", all operation buttons (i.e., Record, Play, Rewind, Fast Forward etc.) on the front panel will be inactive even if these buttons are pressed.
After using, turn the Mode Lock Switch to OFF.

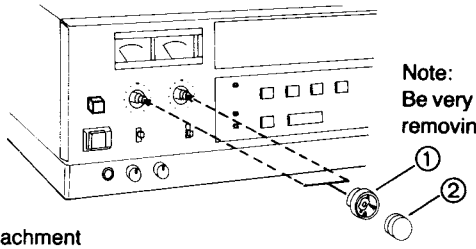
•This function is provided to prevent an unintentional change in operating modes by an accidental pressing of front panel controls.

Note:
When the remote controller is connected to this unit, operation by the remote controller buttons can be performed even if the Mode Lock Switch is set to ON.

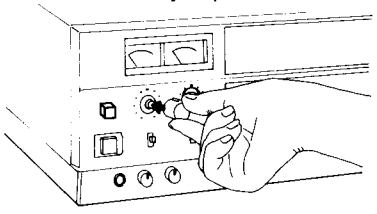
Cap For Protecting Sound Volume

A cap is provided with this unit for protecting the sound volume level during recording. The procedure for attaching and removing the cap is as follows.

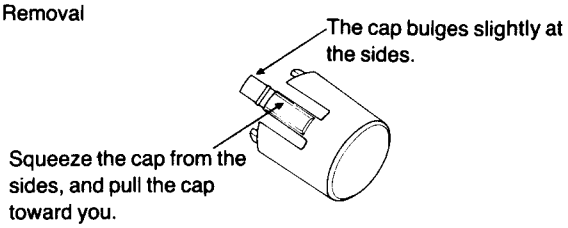
1. Remove Sound Volume Knobs ① and ②.



2. Attachment
Attach the Accessory Caps.

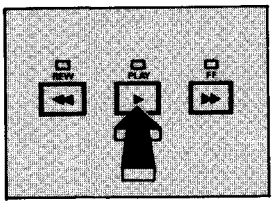


3. Removal



Playback Operation

1. Turn the power ON to all of the units that are connected.
2. Load a pre-recorded cassette tape into the VTR (AG-6810).



3. Press the Play Button. The play lamp lights up and playback starts.
   - The Level Adjustment Controls have no effect during playback.

- If noise appears on the television picture, adjust the Tracking Control for best picture. When playback is finished, return the control to the centre "FIX" position.

Search Reverse/Forward

When the Search Forward Button is held down while the VTR is in the playback mode, the tape will be played back in the forward direction.

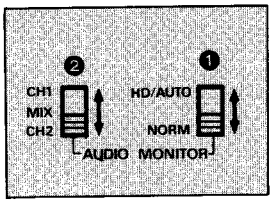
When the Search Reverse Button is held down while the VTR is in the playback mode, the tape will be played back in the reverse direction.

Note:

During search mode, noise may appear over the entire picture and the color picture may change to B/W picture, but this is not a malfunction.

Sound Monitoring

- When monitoring of the sound is done during playback using headphone, follow the procedure outlined here.



❶ Set the Audio Monitor Selector to "HD/AUTO" or to "NORM" depending upon sound type desired.

❷ If normal audio is selected, the monitored channels will be as given in the following chart.

Audio Monitor Selector Channel	Headphone Jack
CH1 MIX CH2	Audio from channel 1 only
CH1 MIX CH2	(Not mixed) Each headphone is separate. channel 1 left channel 2 right
CH1 MIX CH2	Audio from channel 2 only

- Adjust headphone level with the level control.

- **When the Audio CH2 Selector on the rear panel is set to "Time Code"** and the Audio Monitor Channel Selector is set to "CH2" or to "MIX", the sound of the time code being recorded will be heard.

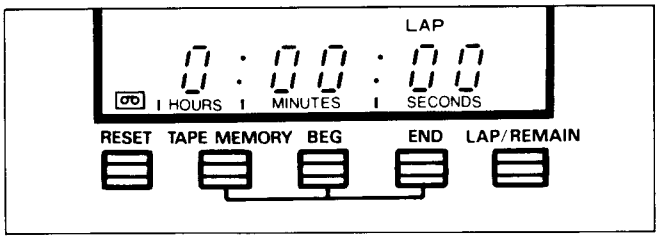
- **When the signal to be monitored is taken from the Audio Monitor Output Jacks on the rear panel,** the output sound is as given in the following chart.

Audio Monitor Selector	Audio Output (NORM/HD)	HD Lamp
HD/AUTO NORM	(See Notes) HD SOUND	HD lights up
HD/AUTO NORM	NORMAL AUDIO	HD goes off

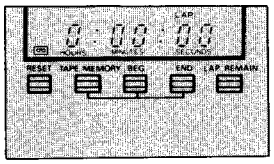
Notes:

1. If HD sound was not recorded, only normal audio will appear from the output NORMAL/HD terminals, even if the switch is set to "HD/AUTO". In such a case, the HD lamp will go off.
2. If a large amount of noise appears on the picture (due to poor tracking of the RF carrier), the unit will automatically switch from HD Sound to Normal Audio. Only normal audio will appear at the NORMAL/HD terminals and the HD Lamp goes off during noisy periods.
   - The unit is normally set for automatic switching between HD and normal audio, but it can also be set inside so that automatic switching does not occur.

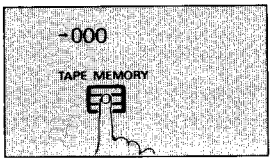
Tape Counter



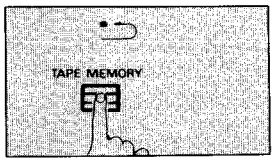
- Counter functions do not work with a tape on which the control (CTL) signal has not been recorded.
- When the tape memory button is pressed, the counter memory modes are switched in the following order. If pressed continuously, it will switch from ❶ through ❹, then return to ❶ again.



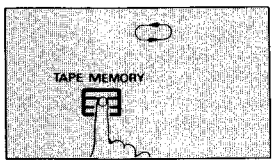
❶ Normal Tape Counter Display Mode (Memory button position for out-of-memory mode).



❷ Position Search Mode (Refer to section on position search).



❸ One-Time Playback Mode (Refer to section on one time playback).

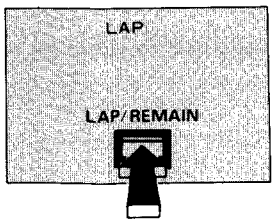


❹ Repeat Playback Mode (Refer to section on repeat playback).

Tape Counter Reset

Press the RESET Button.
Counter indicates 0:00:00 (reset point).

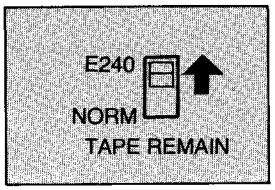
❶ Normal Tape Counter Indications Lap Time Indication



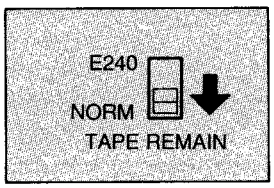
Press the LAP/REMAIN Button so that the "LAP" indicator is illuminated. When the tape is transported, counter indicates the tape position from the reset point (0:00:00).

Remaining Tape Time Indication

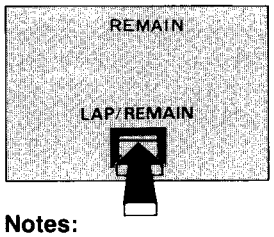
1. Set the Tape Remaining Selector as shown depending on the kind of tape being used.



When the NV-E240 tape is being used, set the Tape Remaining Selector to "E240" position.



When the NV-E180, E120, E90, E60, E30 is used, set the Tape Remaining Selector to "NORM".



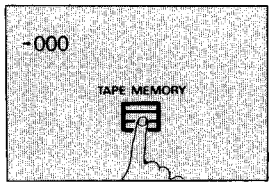
2. Press the LAP/REMAIN Button so that the "REMAIN" indicator is illuminated.
When the tape is transported, the counter indicates the remaining tape time.

Notes:
- When the remaining tape amount comes within about 5 minutes, the " ▭ " display will flash.
- When switched to the display showing remaining tape amount, "E" may be displayed by the tape counter. This indicates that the remaining tape is being calculated.
- Depending on the condition of the used tape, some deviation will occur in the display for the remaining tape amount.

❷ "0:00:00" Position Search

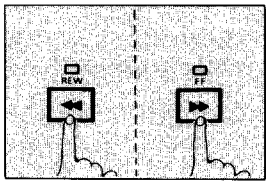
This mode provides automatic stop at a selected point on the tape.

1. Press the RESET Button to set it to "0:00:00" at the place on the tape where you wish to start playback.



2. Press the Tape Memory Button until the "→000" indicator is displayed.

3. Perform Playback or Recording.

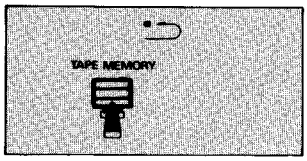


4. Press the Rewind or Fast Forward Button after recording or playback has finished.

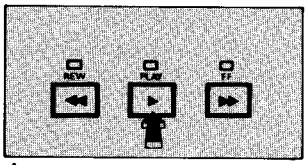
The tape will be rewound or fast forwarded to "0:00:00" position, and then stop.

❸ One-Time Playback

This mode provides a single automatic playback of a selected section of tape each time the Play button is pressed.



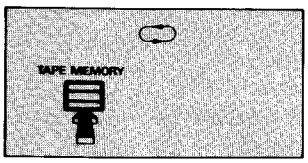
1. Press the Tape Memory Button until the " ⮌ " indicator is displayed.
2. Perform steps 2) and 3) described in the "Normal Repeated Playback" section ❹.



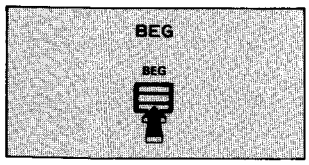
3. Press rewind to access the program start point, and then press the Play Button.
4. Playback starts and continues to the selected program end position. The tape will then be rewound to the program start position at which time it will stop. The segment can be replayed by pressing the Play Button as long as the memory is in " ⮌ " mode.

❹ Normal Repeated Playback (Random Repeat)

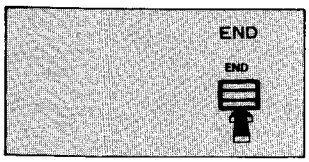
This mode provides automatically repeated playback of a selected section of tape.



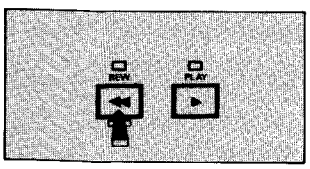
1. Press the Tape Memory Button until the " ⮎ " indicator is displayed.



2. Locate the beginning position of the tape section you wish to repeat playback and then press the BEG Button. "BEG" indicator will illuminate.



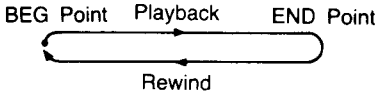
3. Locate the end position of the tape section you wish to repeat playback and then press the END Button. "END" indicator will illuminate.



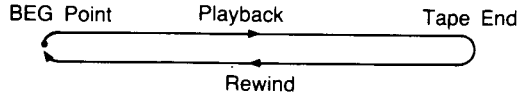
4. Press the Rewind Button to access the repeated playback.
5. The tape will be rewound to the BEG position and the playback will start automatically. After each playback, the tape will automatically rewind to BEG point, and the selected playback will repeat.
6. To stop the repeat playback, press Stop Button.

Beginning and End Points

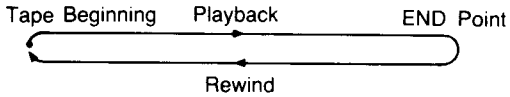
❶ When the BEG and END buttons are pressed in repeat playback, the VTR will repeat the interval between the points at which the BEG and END buttons were pressed.



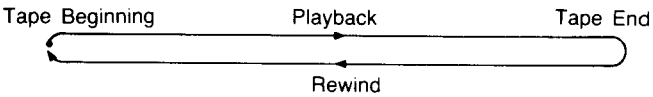
❷ When program END position has not been entered, the tape will be played back repeatedly in between the place where the BEG Button is pressed and the end of tape.



❸ When program BEG position has not been entered, tape will be played back repeatedly in between the beginning of tape and the place where the END Button was pressed.



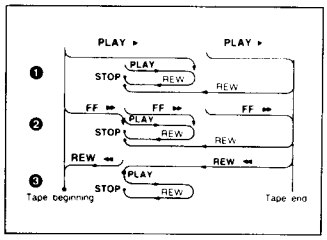
❹ When both program BEG and END points have not been entered, playback will be repeated in between the beginning and end of tape.



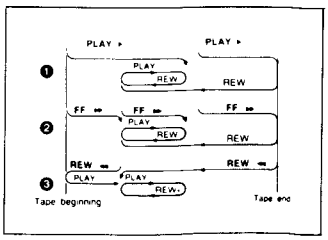
Notes:

- When the BEG point and the END point are the same, or when the END point is smaller than the BEG point, the indicators "BEG" and "END" of the tape counter will flash.
- If repeat playback is continued many times, the playback picture may develop a gradual lag. On the average, the amount of lag per each playback is about one second. If the initial setting and the actual lag of the picture becomes large, perform setting once again.
- If you wish to change the beginning or end point, locate the new desired point on the tape and push BEG or END button. Be sure that BEG and END indicators illuminate when you re-enter the new points. Also, to cancel the beginning point or end point, turn off the "BEG" or "END" display.

One-Time and Repeat Playback modes can also be entered at any point on the tape by using any of the front panel or optional remote control buttons.
When operated this way, the tape movements will depend upon the point where the Play, Fast Forward, or Rewind buttons are pressed as shown in the diagrams below.



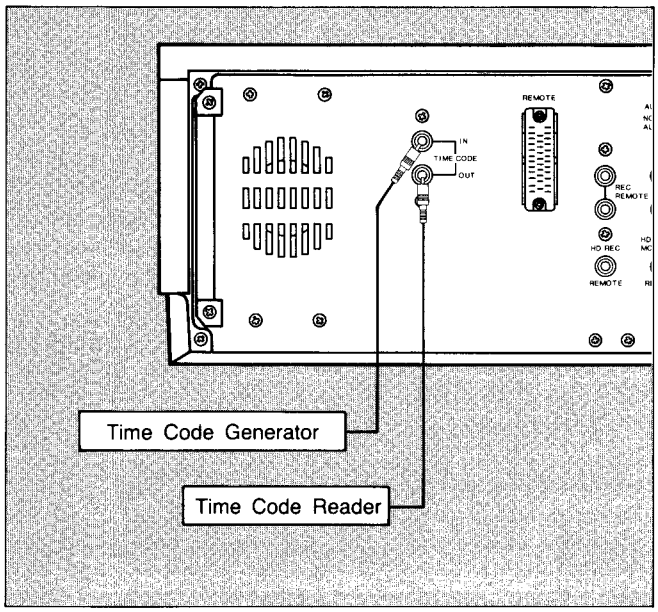
One-Time Playback Mode

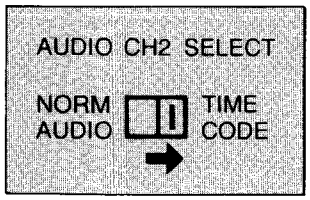


Repeated Playback Mode

Time Code

In order to record the EBU TIME CODE signal, connect the EBU time code generator to the Time Code Input Jack during recording, and select "TIME CODE" on the Audio CH2 Selector. Then time code signal will be recorded on audio CH2 track.





1. Set Audio CH2 Selector on the rear panel to the "TIME CODE" position.

- Time code signals may be recorded during recording mode. For details, refer to the Operating Instructions of your time code generator/reader.

Note:

- The counter display on the VTR does not count the time code signal. It counts the control (CTL) signal recorded on the tape. Therefore, you must connect the Time Code Reader in order to read the time code.

Other Selectable Functions

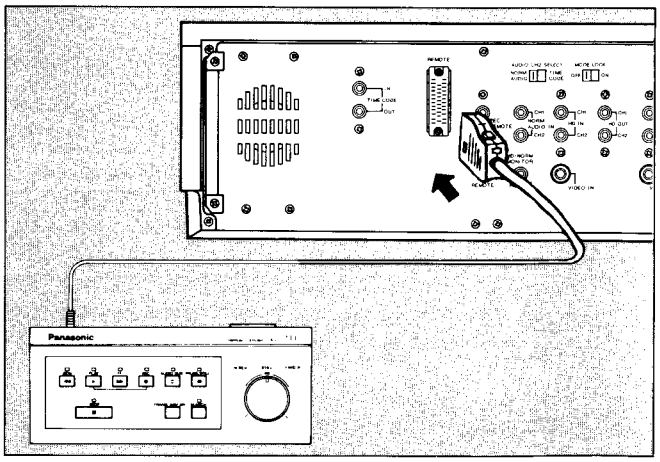
This unit includes the following selectable functions (internal jumper wires selectable):

1. Automatic rewind at end of tape.
   At the time of shipping, this rewind function has been set to ON, but it can also be set inside the unit to the OFF position.
2. Automatic rewind of inserted cassette tape.
   At the time of shipping, this function has been set to OFF, but it can also be set inside the unit to the ON position.
3. Automatic switching between HD and Normal Audio (with Audio Monitor Selector set to HD/AUTO).
   Unit is normally shipped with this function ON, but it can be set inside the unit for the OFF position.
4. Short FF function ON/OFF.
5. ON/OFF for recording with record prevention tab removed.
6. ON/OFF for automatic cassette tape ejection at the tape end during playback.
7. This unit has an AGC (Automatic Gain Control) ON/OFF switch on the internal circuit board. The switch has the following function:
   ON: The same AGC performance as that of the AG-6800 is obtained. (This switch is set to ON at the shipment.)
   OFF: The video AGC function is switched OFF. In this case, video input signal level must be 1.0±0.05 Vp-p at the video input terminal. However, the AGC goes OFF only for colour signal. For B/W signal, AGC keeps ON despite of the OFF position of the switch.

For details, please consult your authorized dealer.

Remote Controller (option)

When the optional accessory AG-A600 remote controller is connected to the remote control connector of this unit, the unit can be controlled from a distance.



- The remote controller has a search dial and some other controls that are not on AG-6810 itself, including search, pause/still, one frame advance, and audio dubbing.
  The search dial permits playback at ½, 1, 2, 5, and 10 times of the normal tape speed in both directions.

When the search and pause controls are used, it is possible that a colour picture will appear in black-and-white and/or that noise will appear over the whole area of the picture. Also during search all audio is muted. For further details read the instruction manual for the remote controller.

Troubleshooting

...Check the following points once again.

The unit does not operate.

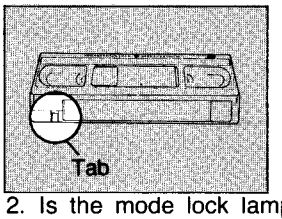
1. Is the MOIST and/or Auto Off Lamp ON?

When the MOIST Lamp lights:
This indicates that dew has formed inside the unit. The unit then ceases to operate and the cassette tape will be ejected automatically. (Eject/Auto Off Lamp also lights.) Keep the unit powered and wait until the lamp goes off. (Depending on the ambient circumstances, the lamp will go off in a few hours' time.)
When the Eject/Auto Off Lamp blinks:
This means that something is wrong with the cylinder motor or photosensor. If the lamp still blinks when the power is switched off and on again, the unit requires servicing.

2. Is the mode lock lamp (ML lamp) ON?
   - This indicates that the Mode Lock Selector on the rear panel is set to ON and all front panel mode controls become inoperative.
     Reset the Mode Lock Selector to the OFF position to allow operation with the front panel controls.

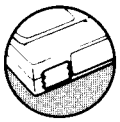
Recording fails to start.

1. Is the record prevention tab on the back of the tape still intact?



When the tab has been broken off

Cover the hole with adhesive tape.



2. Is the mode lock lamp (ML lamp) ON?
   - Follow instructions for item 2 above.

Tape remaining time is incorrect.

- Is the Tape Remaining Selector set correctly?
- Is the Lap/Remain Button set to the "REMAIN" position?

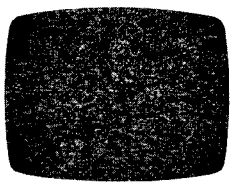
If the playback image is completely distorted.

If the playback image is periodically completely distorted, check the following items:
1. Is radio interference or changes of power voltage occuring during recording?
2. Is horizontal hold control of TV monitor set correctly?
3. Is the cassette tape defective?

Record Prevention Tab on the tape was broken but the recording starts.

Does the Record Tab Lamp (RT) light?
This indicates that the recording can be performed without Record Prevention Tab.
Contact your authorized dealer.

If the picture looks like this then the video head is dirty.



- Have the unit checked by your authorized dealer.

Refer servicing to qualified service personnel.

Interconnections

Remote Connector

Pin. No.	Contents	Pin No.	Contents
1	REC SWITCH*	18	CONTROLPULSEOUT
2	PLAY SWITCH	19	REMOTE 19
3	FF SWITCH	20	START MARK
4	REW SWITCH	21	EJECT SWITCH
5	STOP SWITCH	22	
6	AUDIO DUB SWITCH	23	REC HOLD
7	PAUSE SWITCH	24	PLAY HOLD
8	CASSETTE IN	25	FF HOLD
9	AUDIO DUB SWITCH	26	REW HOLD
10	FF, REW SLOW DOWN	27	
11		28	AUDIO DUB HOLD
12	GND	29	PAUSE HOLD
13	FRAME ADV. SWITCH	30	REMOTE 30
14	REVERSE COUNT	31	AUDIO DUB HOLD
15		32	
16		33	REMOTE 33
17	REVERSE	34	+12 V

Notes:

- When the voltage pin 1 is LOW, the unit will go into the REC mode.
- Remote signals are output by open collector circuit. Therefore, user's remote controller circuit for pins should be designed open collector output circuit or Transistor Transistor Logic (TTL) level.
- Number 34 pin (+12 V) should be used only for our remote controller.

Cautions for Use

- Do not insert fingers or any other objects into the video cassette compartment.
- Avoid operating or leaving the unit near strong magnetic fields. Be especially careful of large audio speakers.
- Avoid operating or storing the unit in an excessively hot, cold, or damp environment as this may result in damage both to the recorder and to the tape.
- This unit is supplied with a 3-prong grounded AC plug—do not try to defeat its purpose. (NOT U.K. MODEL)
- Do not spray any cleaner or wax directly on the unit.
- If the unit is not going to be used for a length of time, set the Power Switch on the rear panel to OFF and protect the unit from dirt and dust.
- Do not leave a cassette in the recorder when not in use.
- Do not block the ventilation slots on the top of the unit.
- Use this unit horizontally and do not place anything on the top panel.
- Cassette tape can be used only for one-side, one direction recording. Two-way or two-track recordings cannot be made.
- Cassette tape can be used for either Colour or Black & White recording.
- Do not attempt to disassemble the recorder. There are no user serviceable parts inside.
- If any liquid spills inside the recorder, have the recorder examined for possible damage.
- Refer any needed servicing to your authorized dealer.

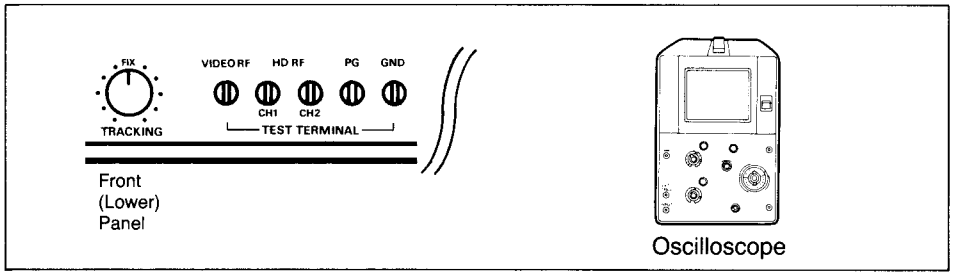
Types of Cassette Tape

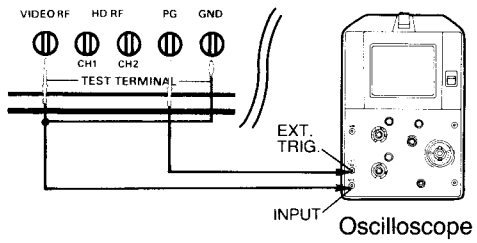
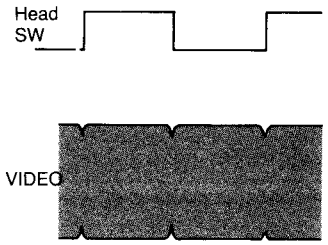
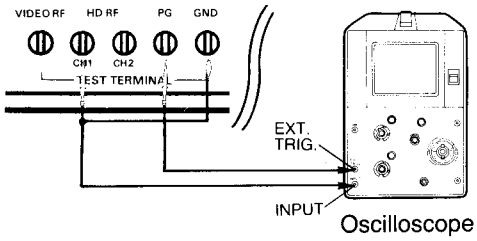
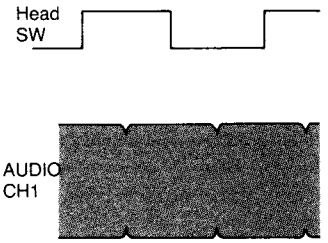
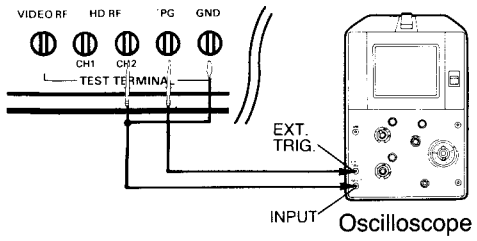
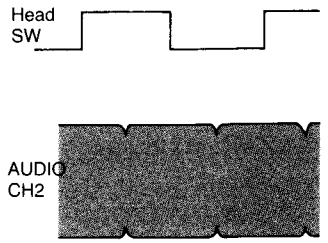
Type	Playing Time
NV-E240	4 hrs.
NV-E180	3 hrs.
NV-E120	2 hrs.
NV-E90	1.5 hrs.
NV-E60	1 hr.
NV-E30	30 minutes

In addition to the tapes specified above, the recorder will accept any cassette tape which has the VHS mark.

Test Points

When an oscilloscope is connected to the Test Terminals on the front panel, the HD sound head output and the video head output can be observed.



Connection	Contents which can be checked	Waveform
	1. Tape run stability 2. Video head contact with the tape 3. Tracking characteristics 4. RF system trouble	
	1. Tape run stability 2. HD sound head contact with the tape 3. RF system trouble	
	Same as above	

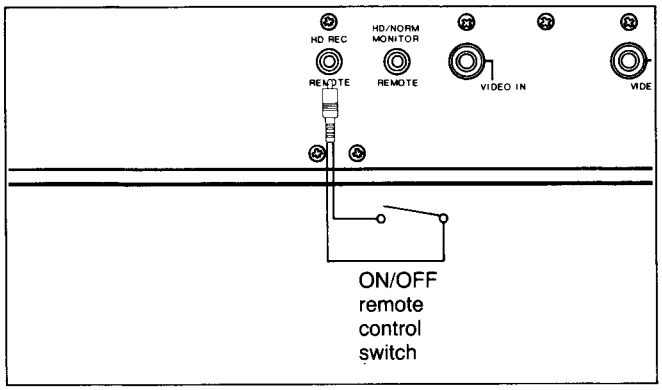
Operation

Connect the oscilloscope probe as shown above, and check the waveform with this unit in playback condition.

Note:
Terminals are provided for customers convenience only. Please do not use the output signals for measurement purposes.

Audio Remote

•HD Sound ON/OFF



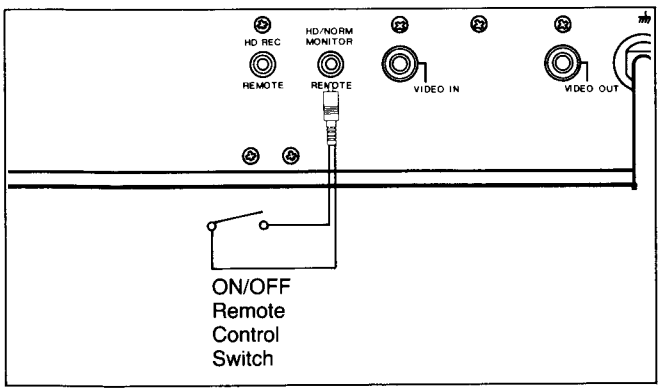
❶ Connect an ON/OFF control switch as shown in the figure.

❷ Put the unit in recording mode.

❸ ON/OFF switch permits audio recording as follows:

Switch	**Recording selector switch**	**Audio which can be recorded**
OFF	HD	HD sound
	NORMAL	Normal audio
ON	——	Normal audio

•HD/NORMAL Monitor



❶ Connect an ON/OFF control switch as shown in the figure.

❷ Put the unit in recording (or playback) mode.

❸ When the switch is set to ON, normal audio can be monitored, while HD sound can be monitored when the switch is set to OFF.

Switch	**Audio which can be monitored.**
OFF	HD sound
ON	Normal audio

Note:
The audio monitor selector switch ㉔ on the front panel will not be effective.

Specifications

Power Source:	AC 110/120/220/240 V, 50-60 Hz
Power Consumption:	Approx. 60 watts
Television System:	CCIR Standard (625 lines, 50 fields) PAL colour signal
Video Recording System:	2 rotary heads, helical scanning system Luminance: FM azimuth recording Colour signal: converted subcarrier phase shift recording
Audio Channel:	4 channels NORMAL (CH1/CH2); 2 fixed heads HD (CH1/CH2); 2 rotary heads
Tape Format:	Tape width 1/2 inch (12.7 mm), high density tape
Tape Speed:	23.39 mm/s
Record/Playback Time:	180 min. with NV-E180
FF/REW Time:	Less than 4.5 min. with NV-E180
Input Level:	Video: VIDEO IN (BNC), 1.0 Vp-p, 75 Ω Audio: LINE IN (Phono); NORMAL (CH1/CH2), HD (CH1/CH2) } −8 dB, 47 kΩ
Output Level:	Video: VIDEO OUT (BNC), 1.0 Vp-p, 75 Ω Audio: AUDIO OUT (Phono); NORMAL (CH1/CH2), HD (CH1/CH2) } −8 dB 1 kΩ HEADPHONES, −16 dB−−60 dB, 8 Ω
HD Record Remote:	(Phono), maintained contact switch closure
HD/NORMAL Remote:	(Phono), maintained contact switch closure
Rec Remote:	(Phono), maintained contact switch closure
Video Horizontal Resolution: (on monoscope test pattern)	Colour: more than 240 lines B/W: more than 300 lines
Audio Frequency Response:	50–10,000 Hz (Normal Audio) 20–20,000 Hz (HD Sound)
Signal-to-Noise Ratio: (Rohde & Schwarz noise meter)	Video: better than 43 dB (B/W) better than 43 dB (COLOUR) Audio: betther than 50 dB (Normal Audio/Dolby NR IN)
Audio Dynamic Range:	better than 85 dB (HD Sound)
Wow and Flutter:	less than 0.005% (HD Sound)
Operating Temperature:	5°C–40°C
Operating Humidity:	35%–80%
Weight:	14.2 kg
Dimensions:	430(W)×392(D)×158(H) mm
Accessories Supplied:	2 pcs. Cap for protecting sound volume

Weight and dimensions shown are approximate.
Specifications are subject to change without notice.

*Noise reduction manufactured under license from Dolby Laboratories Licensing Corporation.

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